

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

By way of this Amendment, Claims 20 and 21 have been amended to delete the recitation of "the compensation circuit" and provide language consistent with the language in independent Claim 18. Accordingly, withdrawal of the claim rejection based on the second paragraph of 35 U.S.C. § 112 is respectfully requested.

The subject matter of this application pertains to a device for protecting a bearing of an electrical machine against damaging passage of current. The device is designed to protect a bearing, which supports the rotor of an electrical machine, against the passage of parasitic current arising from operation of the electrical machine. As discussed in the background portion of this application, parasitic current associated with operation of an electrical machine can cause damage to the bearing which supports the electric motor. The device at issue here is constructed to reduce the possibility of such damage.

As recited in independent Claim 1, the claimed device for protecting the bearing of an electrical machine against damaging passage of current comprises a compensation circuit that produces a compensation current which compensates for the parasitic current arising during operation of the electrical machine and passing through the bearing. The device also comprises a coupling element that directly or indirectly couples the compensation current into the bearing.

As recited in independent Claim 18, the device for protecting a rotor supporting bearing against passage of parasitic current arising from operation of an electrical machine comprises means for producing a compensation current

corresponding in magnitude to the parasitic current but opposite in phase to the parasitic current, as well as coupling means for coupling the compensation current into the bearing.

The Official Action sets forth a rejection of independent Claim 1 based on the disclosure in Japanese Application Publication No. 10 014159 to *Susumu et al.*, and also sets forth a rejection of independent Claim 18 based on the disclosure in *Susumu et al.*, U.S. Patent No. 5,859,529 to *Baumgartl et al.* and/or U.S. Patent No. 6,449,567 to *Desai et al.* Those rejections are respectfully traversed for at least the following reasons.

Considering the comments in the Official Action, it appears there may be a misunderstanding concerning what *Susumu et al.* actually discloses. As understood from the description in the English language abstract, *Susumu et al.* is specifically concerned with reducing or eliminating damage caused by electrocorrosion of a bearing due to shaft current. *Susumu et al.* does not disclose a compensation circuit that produces a compensation current which compensates for parasitic current arising during operation of an electrical machine, and does not disclose producing a compensation current corresponding in magnitude, but opposite in phase, to the parasitic current. Rather, *Susumu et al.* merely seeks to passively reduce the parasitic current.

The shaft current I_j referenced in *Susumu et al.* is not a compensation current which compensates the parasitic current. Rather, the shaft current I_j mentioned in *Susumu et al.* refers to the parasitic current itself. *Susumu et al.* describes in this regard that the shaft current I_j flowing to the bearing is reduced or eliminated by providing means 12 that reduces or eliminates the shaft current I_j . *Susumu et al.*

describes that this makes it possible to reduce or eliminate damage caused by electrocorrosion of the bearing due to the shaft current I_j . Thus, the disclosure in *Susumu et al.* is merely based on the observation that the smaller the shaft current I_j passing through the bearing, the lesser the damage caused by such shaft current I_j . However, it is apparent that the means 12 referenced in *Susumu et al.* does not produce a compensation current. Fig. 3 of *Susumu et al.* illustrates that the means (identified as 12a in Fig. 3) consists of passive components (i.e., a capacitor and a resistor). These components do not product a compensation current, but only attenuate the shaft current I_j .

Thus, the focus of the disclosure in *Susumu et al.* is quite different from the subject matter at issue here as recited in independent Claims 1 and 18. *Susumu et al.* is concerned with reducing the parasitic current itself in a passive manner through use of means 12 that attenuate the parasitic/shaft current I_j . On the other hand, the device at issue here addresses the potential problems created by parasitic current in an active manner. As set forth in Claim 1, a compensation circuit produces a compensation current which compensates for the parasitic current arising during operation of the electrical machine. The means 12 disclosed in *Susumu et al.* does not produce a compensation current which compensates for the parasitic/shaft current. Further, the device at issue here as recited in independent Claim 18 comprises means for producing a compensation current corresponding in magnitude, but opposite in phase, to the parasitic current. Once again, the means 12 disclosed in *Susumu et al.* does not produce a compensation current corresponding in magnitude, but opposite in phase, to the parasitic current. As noted, the means 12

disclosed in *Susumu et al.* is merely a passive mechanism for attenuating or reducing the parasitic/shaft current itself.

Another way in which the claimed device recited in independent Claims 1 and 18 differs from the disclosure in *Susumu et al.* involves the claimed coupling element/coupling means that couples the compensation current into the bearing. The Official Action observes that element Cb disclosed in *Susumu et al.* corresponds to the claimed coupling element/coupling means recited in independent Claims 1 and 18. However, it is apparent from Fig. 2 of *Susumu et al.* that the element Cb is merely a circuit symbol representing the capacitance of the bearing itself and is not a coupling element or coupling means that couples the compensating current into the bearing.

For at least the foregoing reasons, it is respectfully submitted that the claimed device recited in independent Claims 1 and 18 is patentably distinguishable over the disclosure in *Susumu et al.*

The disclosures in *Baumgartl et al.* and *Desai et al.* do not make up for the deficiencies pointed out above with respect to the disclosure in *Susumu et al.* Neither *Baumgartl et al.* nor *Desai et al.* is concerned with avoiding bearing damage associated with parasitic current that arises during operation of an electrical machine. Thus, it can hardly be said that such documents would have motivated one of ordinary skill in the art to apply the disclosures in such documents to the arrangement shown in *Susumu et al.* Moreover, neither document discloses that in order to address such concerns about parasitic current in the context of a bearing, one should provide a compensation circuit that produces a compensation current which compensates for parasitic current arising during operation of an electrical

machine together with a coupling element for directly or indirectly coupling the compensation current into the bearing as set forth in Claim 1. Similarly, neither document describes providing means for producing a compensation current corresponding in magnitude, but opposite in phase, to parasitic current and coupling means for coupling such compensation current into a bearing. Thus, a combination of the disclosures in *Susumu et al.*, *Baumgartl et al.* and/or *Desai et al.* would not have motivated one of ordinary skill in the art to utilize the claimed device recited in independent Claims 1 and 18.

The comments at the top of page four of the Official Action note that *Baumgartl et al.* discloses a voltage transformer T1 having a primary side to which a star point voltage is supplied and a secondary side producing a voltage opposite in phase to the star point voltage. It is believed that this observation is not consistent with the disclosure in *Baumgartl et al.* It is Applicants' understanding that *Baumgartl et al.* discloses a star point on the secondary side of the voltage transformer T1 as discussed beginning in line 21 of column 2 and as illustrated in the drawing figure. Further, there is no disclosure in *Baumgartl et al.* concerning the phase of the voltage. The portions of the disclosure in *Baumgartl et al.* that are referenced in the Official Action (column 1, lines 50-65 and column 2, lines 18-32) do not disclose the phase characteristics recited in, for example, Claims 4 and 11. For these additional reasons, it is respectfully submitted that such claims are further distinguishable over the disclosure in *Baumgartl et al.*

The dependent claims are allowable at least by virtue of their dependence from allowable independent claims. These claims also define further distinguishing characteristics associated with the claimed subject matter at issue here. For

example, Claim 9 recites that the coupling element is arranged such that the coupling of the compensation current takes place into the rotor shaft of the rotor by which the rotor in the bearing is pivotally mounted. As pointed out above, *Susumu et al.* and the other documents relied upon do not disclose producing a compensation current as claimed and do not disclose a coupling element as claimed. Thus, the combined disclosures cannot be said to teach or suggest a coupling element arranged so that coupling of a compensation current takes place into the rotor shaft of the rotor by which the rotor in the bearing is pivotally mounted.

For at least the reasons set forth above, it is respectfully submitted that all of the claims in this application are allowable. Accordingly, withdrawal of the rejections of record and allowance of this application are earnestly solicited.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

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Date: March 29, 2006

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